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FOREIGN TECHNOLOGY DIVISION

SHANGHAI RADIO FACTORY 14
THE FIRST IN THE COUNTRY TO SPECIALIZE IN MOS INTEGRATED CIRCUITS.
IDEAL SEMICONDUCTOR DEVICES, FIELD-EFFECT TRANSISTORS,
AND MOS INTEGRATED CIRCUITS

EDITED TRANSLATION

FTD-ID(RS)T-1697-81 7 July 1982

MICROFICHE NR: FTD-82-C-000932

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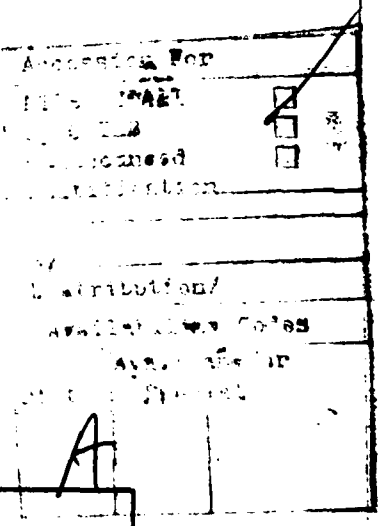
English pages: 4

Source: Kexue Huabao, Nr. 7, 1980, 2 unnumbered pages

Country of origin: China
Translated by: Randy Dorsey
Requester: FTD/TQTR



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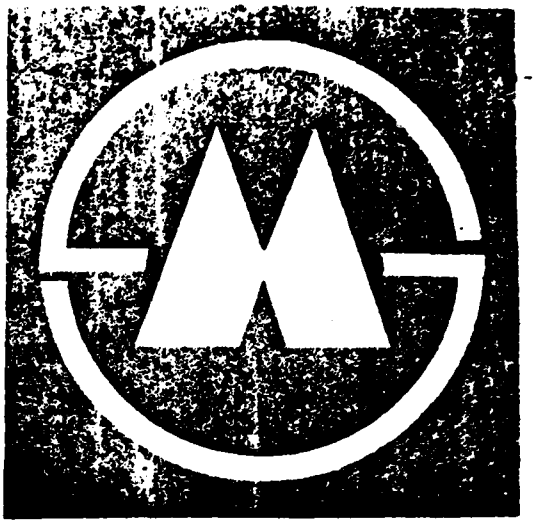


SHANGHAI RADIO FACTORY 14

The First in the Country to Specialize in MOS Integrated Circuits. Ideal Semiconductor Devices, Field-Effect Transistors, and MOS Integrated Circuits.

Ambient effects such as light illumination and temperature can alter the ability of a semiconductor to conduct current; the application of an electric field can also give rise to changes in the ability of a semiconductor to conduct current. This is the surface field effect of semiconductors. Field-effect transistors, which are made utilizing field effects, generally have both the advantages of small transistor area, light weight, low power consumption, and high reliability, as well as the characteristic of the same high input resistance as a pentode electron tube and moreover have the outstanding properties of especially low noise, strong anti-jamming and anti-radiation abilities and wide blocking (dynamic) range.

At the present time, field-effect transistors are divided into two major types: one type is known as the 3DJ junction field-effect transistor; its switching speed is extremely high. The other is known as the MOS (metal-oxide semiconductor) field-effect transistor; its input resistance is extremely high, it is convenient for direct coupling, and when it is used to manufacture integrated circuits, there is a natural electrical isolation (a nonconducting depletion region) between each element, and consequently designing is easy, manufacturing technology is simple, and it can increase the degree of integration.

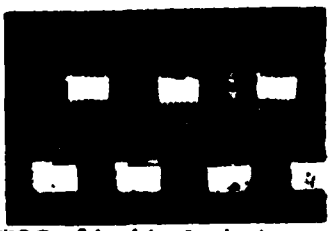
MOS field-effect transistors have two types of channels, P-type and N-type, and when integrated circuits are formed, two types of tubes, N-channel and P-channel, can be incorporated into the circuit at the same time. Such a circuit is commonly known as a complementary metal-oxide semiconductor integrated circuit, or CMOS integrated circuit, for short. Like other types of logic circuits, the CMOS integrated circuit can be comprised of static or dynamic logic circuits which have various kind of functions. The power consumption of CMOS intregrated circuits is extremely low, switching speed is high, they operate on a wide range of power source voltages and are easy to interface with other types of logic circuits. As a result of this, CMOS integrated circuits have obtained wide application in various kinds of logic circuits, large-scale memories, as well as in the fields of microprocessors and electronic wrist watches.

Shanghai Radio Factory 14 is the first factory in the country to specialize in the manufacture of field-effect transistors and field-effect integrated circuits. The factory has accumulated more than ten years production experience, its industrial equipment is advanced, and in order for all the trades and professions to accomplish automation, a large number of various series of field-effect devices have been furnished and favorable comments have been received from the most advanced defense industry organizations.

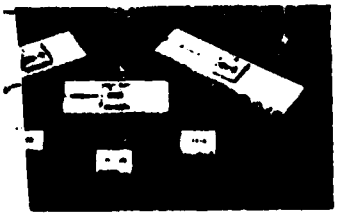
The field-effect devices produced by Shanghai Radio Factory 14 are:

1. Various series of FETs such as 3DO, 3DJ, and 3CJ.
2. PMOS general-purpose digital integrated circuits.
3. Field-effect large-scale digital integrated circuits:

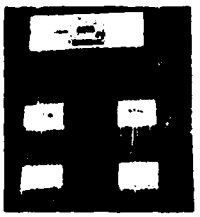
(1) DJS-051 Microprocessor. An integrated 8-bit central processing unit (CPU) consisting of 4 N-channel silicon gate MOS-LSI circuits. Its instruction system is completely compatible with the



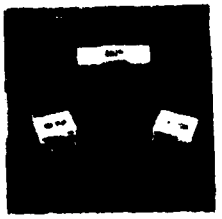
CMOS digital integrated circuits



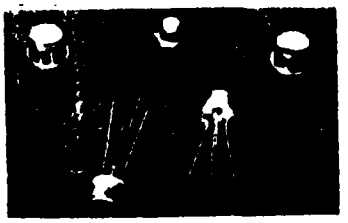
DJS-051 microprocessor circuits



Interfaces



Memories



Field-effect transistors

8080A. Only advanced microprogramming design concepts were employed thus allowing instruction expansion based on an increase of one CROM. This kind of chip provides a means for high performance solution of control and processing, and functionally replaces the 8080A as well as system control unit 8228.

Its principal specifications are:

Word length: 8 bits
Address bus: 16 bits
Number of elementary instructions: 78 (can be expanded)
Instruction execution time: 4~17 μs
Power source voltage: +12V, +5V, -5V

(2) DJS-010 4-bit microprocessor. Consists of 5 circuits: a central processing unit (CPU), a program memory (ROM), a data memory (RAM), a clock generator and a display unit. It has a 4-bit parallel processing function, 5 synchronous inputs, 3 nonsynchronous inputs, and 45 elementary instructions.

Its principal specifications are as follows:

RAM capacity: 64 X 4 bits (can be expanded to 64 X 8 bits)
ROM capacity: 1008 X 8 bits (can be expanded to 2 X 1008 X 8 bits)
Instruction mean execution time: 10 μs

(3) Large-scale memory circuits. Their series are:
CN201 static 256 X 1 bit, CN203 static 1024 X 1 bit, CN202 dynamic 1024 X 1 bit read write memory and CN2107 dynamic 4096 X 1 bit

random memory.

4. CMOS general-purpose integrated circuits. Widely used in the fields of digital instruments, digital communication, microcomputer, and space electronics systems. There are presently more than 50 series of products, such as:

C031~C044: 14 types of gate circuits and flip-flops;
C180~C187: 8 types of various counters;
C301~C305/C271~C275: 4 types of encoders;
C420~C424/C390~C394: 5 types of shift registers;
C510~C690 series: more than 20 types of arithmetic units and special types of circuits.

The products listed above are distributed by the Chinese Radio Equipment Company and various large distinguished companies under direct agreement by our factory.

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